

U.S.S.N. 10,656,585

Remarks

Thorough examination by the Examiner is noted and appreciated.

The Specification has been amended to correct grammatical errors.

The claims have been amended to clarify Applicants disclosed and claimed invention. The amendments find support in the original claims and/or the Specification. No new matter has been added.

Support for the amendments is found in the Specification:

At line 6, page 21 (see claims 1, 24, 31)

"An ingot mount head 34 is provided on the extending or distal end of the support 32 of the pre-conditioning head 30. An ingot 36 is typically **removably mounted** on the bottom surface of the ingot mount head 34, typically using screws (not shown) or other fastening techniques known by those skilled in the art."

At line 4, page 17: (see claims 4, 6, 26, and 31)

U.S.S.N. 10,656,585

"For example, for a copper CMP operation, the ingot is preferably copper. Similarly, a silicon dioxide ingot is preferably used to pre-condition the polishing pad in an oxide CMP operation, whereas a tantalum ingot is preferably used to pre-condition the polishing pad in a tantalum CMP operation."

At line 18, page 21: ((see claims 22, 27, 33, and 34)

"Preferably, the disk-shaped ingot 36 has a diameter of typically about 6~8 inches and a thickness of typically about 1~10 cm, and preferably, about 4~5 cm. As shown in FIG. 4, the ingot 36, normally disposed in a raised position with respect to the polishing surface 90 of the polishing pad 86, as indicated by the solid lines, may be selectively lowered and pressed against the polishing surface 90 by operation of the actuation motor 42, as indicated by the phantom lines and as hereinafter further described."

And beginning at line 6, page 22: (see claims 1, 21, 26, 28, 31, and 32).

"Referring next to FIGS. 3-5, in use of the pre-conditioning arm 30, before production wafers are polished using the CMP apparatus 80 time must be allotted to warm or pre-condition the polishing pad 86 and to facilitate flow of polishing slurry (not shown) from a slurry container (not shown) and through the slurry dispensing nozzles 92 of the slurry delivery arm 84. Accordingly, as the polishing pad 86 is rotated as shown in FIG. 3, the ingot

U.S.S.N. 10,656,585

36 is lowered in place against the polishing surface 90, as indicated by the dashed lines in FIG. 4, by operation of the actuation motor 42. Preferably, the ingot 36 is pressed against the rotating polishing surface 90 at a pressure of typically about 4~5 psi for typically about 40~60 seconds. Simultaneously, polishing slurry (not shown) is distributed from the slurry tank (not shown) and onto the polishing surface 90 of the polishing pad 86 through the slurry dispensing nozzles 92 of the slurry delivery arm 84. As the polishing pad 86 rotates typically during transit of the polishing slurry to the slurry dispensing nozzles 92 (for typically about 40~60 seconds), friction is generated between the polishing surface 90 and the bottom surface of the ingot 36. The pre-conditioning arm 30 may be simultaneously swept across the polishing surface 90 in a side-to-side motion to increase the contact surface area between the ingot 36 and the polishing surface 90. This friction heats the polishing pad 86 to a stable operational temperature suitable for subsequent polishing of production wafers (not shown) using the polishing head 100, as shown in the graph of FIG. 5. When this stable operational temperature is reached, the actuation motor 42 is operated to lift the ingot 36 from the polishing surface 90, after which a production wafer (not shown) is mounted on the bottom surface of the polishing head 100 and rotated and polished against the polishing surface 90, typically in conventional fashion. It will be appreciated by those skilled in the art that the ingot 36 is capable of repeated usage without the need for replacement and significantly reduces the cost associated with using multiple successive dummy wafers to heat the polishing pad 86 to the operational temperature."

And at line 5, page 19: (see claims 25, 30, and 31)

U.S.S.N. 10,656,585

"A conditioning arm 88, having a conditioning head 82, is pivotally mounted on the base 81 and can be extended over and swept across the polishing surface 90 of a polishing pad 86 provided on the platen 96."

Claim Rejections under 35 USC 112

Claim 4 has been amended to overcome Examiners rejection.

Claim Rejections under 35 USC 102

1. Claims 1-8 stand rejected under 35 USC Section 102(b) as being anticipated by Berman (US 6,273,798).

Berman discloses an apparatus for either pre-conditioning or conditioning a polishing pad. Berman discloses a head section having at least two heads whereby the head section can be rotated to engage either a conditioning head or a preconditioning head (see Abstract; col 3, lines 21-34). Berman further teaches that the preconditioning wafers used for preconditioning should have a coating of the same or similar material as that which will undergo polishing on a production wafer surface (col 2, lines 51-59) to overcome the "first wafer effect", taught to be due to a non-equilibrium of polishing material removed (col 2, lines 22-23).

U.S.S.N. 10,656,585

39). Berman also teaches that the preconditioning film (coating) on the preconditioning wafer should have a thickness of between about 20 and 30 mils (col 7, lines 32-48).

Berman further teaches that that the method and apparatus which is automated to load and unload pre-conditioning wafers (col 10, lines 7-34) to the pre-condition head overcomes the problem of transportation of pre-conditioning wafers to the polishing apparatus (col 5, lines 29-40).

With respect to claim 1, nowhere does Berman disclose a preconditioning head having a removable carried ingot as Applicants have disclosed and claimed.

In addition, nowhere does Berman disclose an "actuation mechanism operably engaging said pre-conditioning arm for selectively moving said ingot into and out of contact with the substrate at a selected contact pressure".

Berman is insufficient to anticipate Applicants disclosed and claimed invention with respect to Applicants independent and dependent claims.

0.S.S.N. 10,656,585

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

2. Claims 1-8 stand rejected under 35 USC Section 102(b) as being anticipated by Tsai (US PUB 2002/0098779).

Tsai discloses a polishing apparatus including an **abrasive conditioning head** (as opposed to a preconditioning head) where a **rotatably mounted** copper conditioning plate is disclosed to be used continuously (during polishing) or periodically for **conditioning a polishing pad** (see Abstract; paragraph 0033; Figure 2, item 160, 162; paragraph 0041).

Thus Tsai does not disclose several aspects of Applicants disclosed and claimed invention.

U.S.S.N. 10,656,585

For example, Tsai does not disclose a "pre-conditioning apparatus".

Tsai also does not disclose "an actuation mechanism operably engaging said pre-conditioning arm for selectively moving said ingot into and out of contact with the substrate at a selected contact pressure."

Rather, Tsai discloses a copper **conditioning plate** for leaving an amount of copper on the pad to reduce a polishing chemical to copper imbalance. Tsai does not disclose the structure of the copper conditioning plate, i.e., whether it is an ingot or has a copper coating. Tsai also teaches that the copper plate is rotatably mounted.

Tsai is also insufficient to anticipate Applicants disclosed and claimed invention with respect to Applicants independent and dependent claims.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v.*

0.S.S.N. 10,656,585

*Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

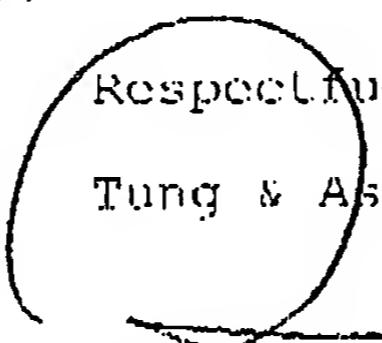
"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Based on the foregoing, Applicants respectfully submit that the Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention as claimed is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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